CHAPTER 9

CHEST MOUNTED POSITIVE PRESSURE REGULATOR

CRU-88/P, P/N 2900W000

Section 9-1. Description

9-1. GENERAL.

9-2. The Chest Mounted Positive Pressure Regulator, CRU-88/P, P/N 2900W000 (figure 9-1) is manufactured by Normalair-Garrett Limited (CAGE U1605) and is designed to regulate oxygen enriched air to the aircrewmembers during flight. Table 9-1 contains the leading particulars of the regulator.

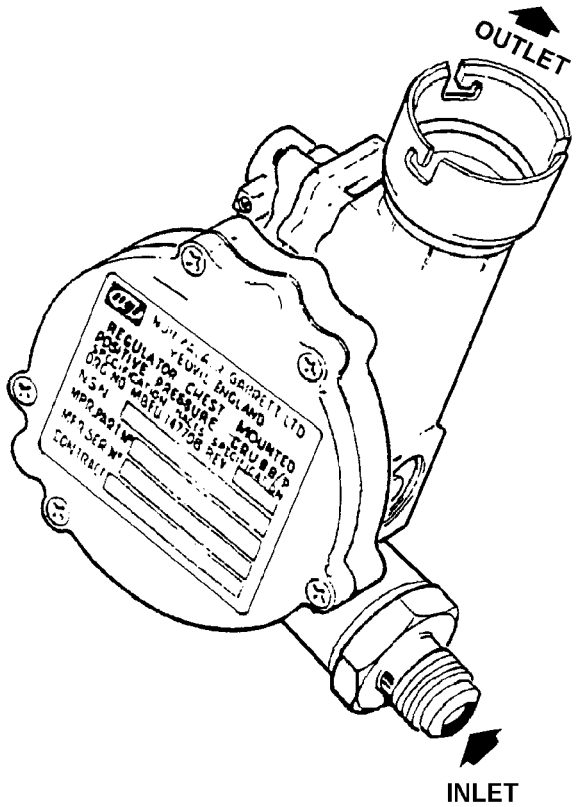


Figure 9-1. Chest Mount Positive Pressure Regulator, CRU-88P, P/N 2900W000

Table 9-1. Leading Particulars

Inlet Pressure	5 to 120 psig
Flow	0 to 180 lpm
Operating Altitude	0 to 50,000 feet
Operating Temperature	-65° to +165°F
Weight	10.25 oz
Inlet Connection	Per MS33656-6 (to mate with 0.375 in OD flared tube per MS33583 or MS33584
Outlet Connection	Per figure 6 of MIL-C-38271 (to mate with three pronged bayonet connector per MS27796)
Mounting	Two mounting pins per Naval Air Systems Command drawing 1440AS101

9-3. The Chest Mounted Positive Pressure Regulator reduces and regulates supply pressure for breathing oxygen enriched air. The safety pressure feature automatically maintains a positive pressure in the mask of 0.5 to 4.0 inches of water (inH_2O) at all altitudes up to approximately 34,000 feet. The pressure breathing maintains a positive pressure in the mask up to 20 inH_2O at altitudes between 34,000 and 50,000 feet with the positive pressure increasing with altitude.

9-4. Chest-mounted oxygen regulators can be used routinely up to approximately 43,000 feet (cockpit altitude) with 100% oxygen and up to approximately 41,000 feet with OBOGS. However, due to human limitations, chest-mounted regulators shall not be used above these altitudes (depending on the oxygen system) except for very short periods. Above these altitudes, aircrew will suffer rapid and severe hypoxia.

9-5. CONFIGURATION.

9-6. The CRU-88/P regulator a chest mounted and is designed for use with the MBU-14 series oxygen mask. Refer to NAVAIR 13-1-6.7-3 for personal configurations of the MBU-14 series oxygen mask.

9-7. FUNCTION.

9-8. The functional characteristics of the regulator are as follows:

NOTE

Refer to figure 9-2 for index numbers referred to unless otherwise noted.

1. The balance demanded valve (8) is held in the slightly open position by the action of the safety pressure spring (11) loading the sensing diaphragm (13). This gives the regulator its constant safety pressure feature. Loss of gas is prevented by either donning the mask or isolating the gas supply.

2. The use of the balanced demand valve (8), which has a piston at one end of equal area to the valve head at the other end, ensures that breathing effort is kept to a minimum.

3. Leakage from the labyrinth seal (7) at the piston end of the balanced demand valve (8) is allowed to spill into the sensing chamber (1). From the sensing chamber, it passes through the orifice (12) in the sensing diaphragm (13) into the pneumatic control system of the regulator.

4. Linked to the pneumatic control system is the pressure breathing control which is formed by the pressure breathing aneroid (14) and its respective seating, the dump valve (2) and maximum pressure relief valve (1).

5. The flow through the sensing diaphragm (13) is utilized for raising the control pressure in the pneumatic control system, where it acts on the control side of the sensing diaphragm (13) to bias the balanced demand valve (8), raising the delivery pressure of the regulator.

6. The increase in control pressure is achieved by restricting the flow to ambient at the pressure breathing control at altitudes above 35,000 feet.

7. The control pressure also provides the compensating pressure to the control side of the dump valve diaphragm (2). This is required for pressure breathing conditions to prevent the valve from venting unnecessarily.

8. Under normal conditions, the dump valve (2) is held closed by a light spring load. This allows the valve to open due to the slightest abnormal use in delivery pressure under such conditions as explosive decompression. rapid rates of climb, pumping of the mask due to head movement and of constant flow failure of the regulator.

9. Excessive pressure in the pneumatic control system is prevented by the maximum pressure relief valve (1).

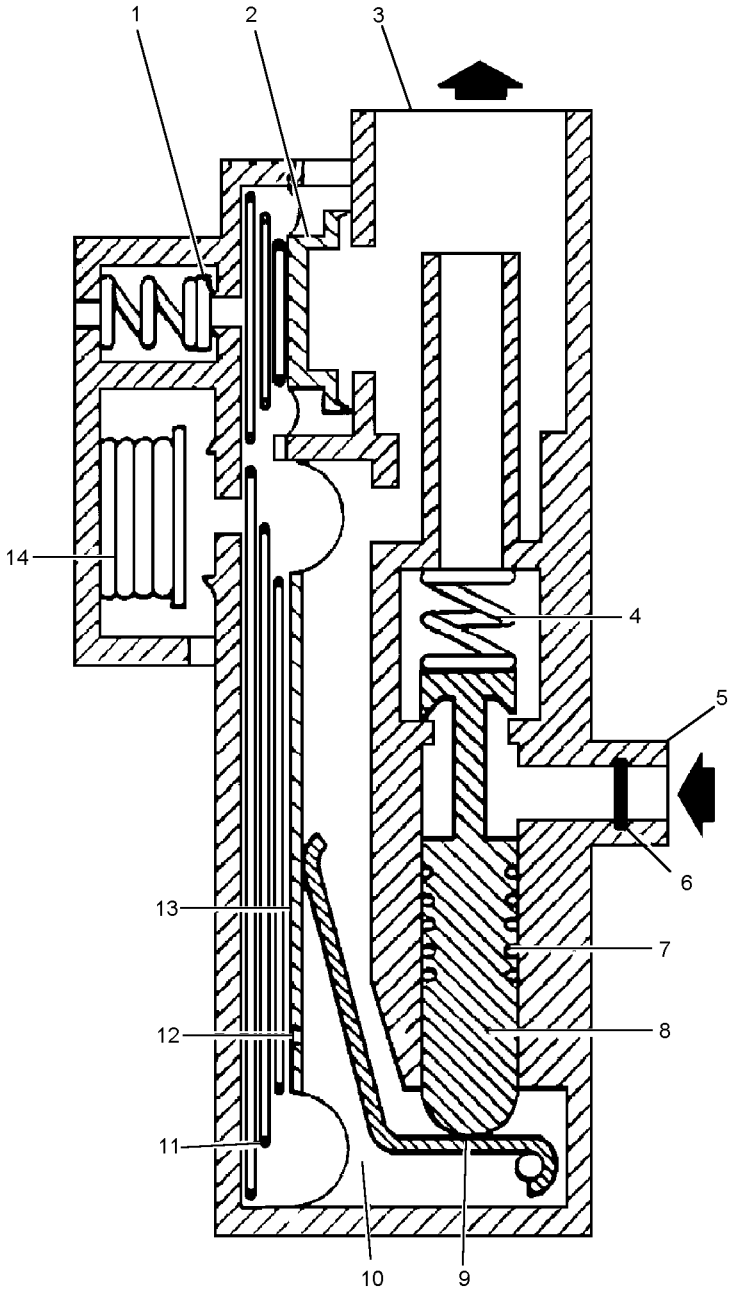
9-9. OPERATION.

9-10. The operation characteristics of the regulator are as follows:

NOTE

Refer to figure 9-2 for index numbers referred to unless otherwise noted.

1. Oxygen enriched air enters the regulator at the inlet (5) where it passes through a 2 micron filter (6) before reaching the balanced demand valve (8) where it applies an equal gas load to the valve head and piston. The safety pressure spring (11) loading through the sensing diaphragm (13) and lever (9) will hold the balanced demand valve in an open position until there is a restriction of the delivery flow (such as donning the mask) causing the pressure at the outlet (3) and sensing chamber (10) to rise to the preset level of safety pressure. This causes the sensing diaphragm to be pushed back against the safety pressure spring (11) and allows the demand valve to close under the action of the return spring (4).



1. MAXIMUM PRESSURE RELIEF VALVE
2. DUMP VALVE
3. OUTLET
4. RETURN SPRING
5. INLET
6. FILTER
7. LABYRINTH SEAL
8. BALANCED DEMAND VALVE
9. LEVER
10. SENSING CHAMBER
11. SAFETY PRESSURE SPRING
12. ORIFICE
13. SENSING DIAPHRAM
14. PRESSURE BREATHING ANEROID

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Figure 9-2. Chest Mounted Positive Pressure Regulator (CRU-88/P) Schematic Diagram

2. The regulator remains in the balanced state until a demand is applied, when the resultant pressure reduction in the sensing chamber (10) causes the sensing diaphragm (13) to deflect the lever (9) and gas to flow from the demand valve to satisfy the demand.

3. Bleed flow sensing through the pneumatic control system is restricted by the pressure breathing control, which is loaded by the expansion of the pressure breathing aneroid (14). The control pressure is raised until it balances the load applied by the pressure breathing aneroid onto its valve seat.

9-11. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

9-12. The Illustrated Parts Breakdown, Section 9-5, contains information on each assembly, subassembly, and component part of the regulator. The figure and index numbers, reference or part number, description, and units per assembly are provided with the breakdown.

Section 9-2. Modifications

9-13. GENERAL.

9-14. There are no modifications to the Chest Mounted Positive Pressure Regulator (CRU-88/P) required/authorized at this time.

Section 9-3. Performance Test Sheet Preparation

9-15. GENERAL.

9-16. Preparation of the positive pressure regulator Performance Test Sheet used during Bench Tests requires that, through the use of various graphs, actual flows provided in this section be converted to indicated flows. Actual flows are stated in liters per minute (lpm) and are not measurable by the manometers used on oxygen regulator tests stands. The flows must be converted to inH_2O pressure, the form of measurement which can be read on the test stand manometers. Zero lpm flows do not require conversion as 0 lpm = 0 inH_2O.

NOTE

The Various graphs supplied with each Oxygen System Components Test Stand, Models 1172AS100 and 1316AS100 are used in converting flows. The graphs supplied with aneroid each test stand are not interchangeable. The model 2900W000 regulator delivers 100% enriched gas produced by LOX and 94% enriched gas produced by OBOGS at all times. Therefore only the nitrogen (N_2) line on the outlet graph for the specified altitude will be used.

9-17. The Performance Test Sheet shall be prepared as shown in figure 9-3. The Performance Test Sheet is a sample only, but may be reproduced for local use.

9-18. The following tests require conversion of flows from actual lpm to indicated inH_2O.

1. Safety pressure test.

2. Pressure breathing test.

9-19. REGULATOR PERFORMANCE TESTS.

9-20. SAFETY PRESSURE TEST. To convert the 50 and 100 lpm flows, proceed as follows:

1. Using the specified altitude output graph, locate the 50 and 100 lpm line on the bottom of the graph and trace the line up to where each lpm line intersects the 100% N_2 line.

2. Trace each line from the point of intersection across the graph to determine inH_2O.

3. Enter the inH_2O figures for their respective 50 or 100 lpm flows in the appropriate block on the Performance Test Sheet.

REGULATOR PERFORMANCE TEST SHEET

NORMALAIR-GARRET REGULATOR
TYPE CRU-88/P (OBOGS) (P/N 2900W000)

DATE _____ REGULATOR SERIAL NO. _____ TEST STAND SERIAL NO. _____

TEST STAND OPERATOR: _____ CDI _____

1. OVERALL LEAKAGE TEST: 70 PSIG. (ALLOWABLE LEAKAGE 750 CCM) _____ CCM

1A. MAXIMUM PRESSURE RELIEF VALVE TEST: (17 - 20 INH_2O) READING _____

2. DEMAND VALVE LEAKAGE TEST: NOTE: READING AFTER 5 MINUTES SHALL NOT EXCEED ± 0.1 INH_2O DIFFERENCE FROM INITIAL READING

30 PSIG INLET PRESSURE — INITIAL OUTLET READING _____ 0.5 - 1.5 INH_2O

5 MINUTES READING _____

120 PSIG INLET PRESSURE — INITIAL OUTLET READING _____ 0.5 - 1.5 INH_2O

5 MINUTES READING _____

3. SAFETY PRESSURE TEST:

ALTITUDE (FEET)	INLET PRESS. (PSIG)	0 LPM FLOW (INH_2O)	OUTLET PRESS. (INH_2O)	READING	50 LPM FLOW (INH_2O)	OUTLET PRESS. (INH_2O)	READING	100 LPM FLOW (INH_2O)	OUTLET PRESS. (INH_2O)	READING
SEA LEVEL	10	0	0.5 - 1.5			0.5 - 1.5			0.5 - 3.0	
SEA LEVEL	90	0	0.5 - 1.5			0.5 - 1.5			0.5 - 3.0	
10,000	10	0	0.5 - 1.5			0.5 - 1.5			0.5 - 3.0	
10,000	90	0	0.5 - 1.5			0.5 - 1.5			0.5 - 3.0	
30,000	10	0	0.5 - 1.5			0.5 - 1.5			0.5 - 3.0	
30,000	90	0	0.5 - 1.5			0.5 - 1.5			0.5 - 3.0	

4. PRESSURE BREATHING TEST:

ALTITUDE (FEET)	INLET PRESS. (PSIG)	0 LPM FLOW (INH_2O)	OUTLET PRESS. (INH_2O)	READING	100 LPM FLOW (INH_2O)	OUTLET PRESS. (INH_2O)	READING
34,000	10	0	0.5 - 2.7			0.5 - 3.7	
34,000	90	0	0.5 - 2.7			0.5 - 3.7	
45,000	10	0	13.0 - 16.0			13.0 - 16.0	
45,000	90	0	13.0 - 16.0			13.0 - 16.0	
50,000	10	0	16.0 - 20.0			16.0 - 20.0	
50,000	90	0	16.0 - 20.0			16.0 - 20.0	

Figure 9-3. Regulator Performance Test Sheet

9-21. PRESSURE BREATHING TEST. To convert the actual lpm flows, proceed as follows:

NOTE

Some test stands have an output graph for each altitude. However, some test stands are provided with only one output graph for all altitudes. Use appropriate altitude N_2 line on these graphs. To ensure the correct regulator outlet performance is recorded, a 10 lpm demand must be applied during all altitude changes prior to taking the 0 lpm reading.

1. Using the 34,000-feet output graph, locate the 100 lpm line on the bottom of the graph and trace the line up to where it intersects the N_2 line.

2. Trace the line from the point of intersection across the graph to the left hand column and determine the inH_2O.

3. Enter the inH_2O figure in the appropriate block on the Performance Test Sheet.

NOTE

If a graph is not provided for an altitude of 34,000 feet, use the 35,000-feet graph.

4. Repeat steps 1 through 3 for 45,000 and 50,000 feet to convert to 100 lpm flows to inH_2O.

Section 9-4. Maintenance

9-22. GENERAL.

9-23. This section contains the information necessary to inspect, test, troubleshoot, disassemble, clean, assemble and adjust the Chest Mounted Positive Pressure Regulator at the Intermediate Level maintenance.

NOTE

The regulator will be considered beyond economical repair when the cost of the parts exceed approximately 75 percent of the cost of the regulator. Whenever any repair or replacement of parts is made to a regulator, a corresponding entry shall be made on the Aircrew Personal Equipment Record for that regulator. Upon completion of any maintenance action (e.g. inspection repair modification etc.) be sure to complete the required Maintenance Data Collection system forms.

9-24. The Chest Mounted Regulator shall be maintained at the lowest level of maintenance authorized to perform the maintenance functions. Major repair of the regulator is not authorized. Minor repairs and testing shall be performed at the Intermediate Level maintenance. Minor repairs include replacement of worn, defective, or otherwise damaged parts with available replacement component parts. Minor repairs to component parts (chasing crossed threads or slightly damaged threads or smoothing of slight burrs) are authorized where such repairs does not cause leakage.

9-25. The regulator shall remain in service for as long as it continues to function correctly and does not require excessive repair. All affected silicone rubber parts shall be replaced routinely whenever a regulator is disassemblesd for repair.

9-26. Procedure steps outlined in this section are listed under the inspection cycle in which they are required, and in the sequence in which they normally occur.

9-27. INSPECTION.

9-28. DAILY/PREFLIGHT INSPECTION. The Daily/Preflight Inspection is a Visual Inspection performed by the aircrewmember to whom the regulator is issued. These procedures shall be performed daily or prior to each flight. To perform the inspection, visually inspect the following:

WARNING

When working with oxygen, ensure that clothing, tubing, fittings and equipment are free from oil, grease, fuel, hydraulic fluid or any combustible material. Fire or explosion may result when even slight traces of combustible material come in contact with oxygen under pressure.

1. Inlet and outlet connections for security of attachment. Ensure that all clamps, locknuts, fittings and screws are tight.

2. Regulator body for dents, scratches, corrosion, condition of nameplate, cracks or any other damage.

3. Perform a Functional Test in accordance with paragraph 9-30, steps 2, 3 and 4.

9-29. If discrepancies are found or suspected, the defective regulator shall be removed and a Ready For Issue (RFI) regulator installed, The defective regulator shall be taken to the Aviators Equipment Branch for the required corrective maintenance action.

NOTE

All equipment forwarded from the Organizational Level maintenance to the Intermediate Level shall be accompanied by the appropriate form in accordance with OPNAVINST 4790.2 Series. The test stand operator and CDI shall sign the Performance Test Sheet and the original or a copy shall be forwarded to the organizational custodian. Upon completion of the Bench Test and/or Calendar Inspection, the organizational custodian shall retain the appropriate forms in accordance with OPNAVINST 4790.2 Series.

9-30. SPECIAL INSPECTION. Special Inspections are required at 30-day intervals in addition to the Daily/Preflight or Calendar Inspections. These inspections consist of a Visual Inspection and a Functional Test, both performed by personnel of the Aviators Equipment Branch. To perform the Special Inspection, proceed as follows:

1. Visually inspect the regulator in accordance with paragraph 9-28.

WARNING

When working with oxygen, ensure that clothing, tubing fittings and equipment are free from oil, grease, fuel, hydraulic fluid or any combustible material. Fire or explosion may result when even slight traces of combustible material come in contact with oxygen under pressure.

2. Functionally test by attaching the regulator, delivery tube and mask assembly to a suitable oxygen supply source. Use regulator-to-seat kit hose for attachment.

3. Turn supply source on. There should be a flow of oxygen through the mask.

NOTE

Resistance during exhalation is due to the positive pressure feature of the regulator.

4. Don mask and breathe. There should be a slight resistance on exhalation, and no mechanical noise or vibration from the regulator.

9-31. Make necessary entries on appropriate form in accordance with OPNAVINST 4790.2 Series.

9-32. CALENDAR INSPECTION. The Calendar Inspection shall be performed on all chest mounted regulators upon issue prior to installation in an in-service personal oxygen configuration, and shall be performed on all chest-mounted regulators in service at least every 90 days.

9-33. The Calendar Inspection consists of a Visual Inspection and a Bench Test. All work shall be performed in a clean, dust-free and oil-free area.

9-34. Visual Inspection. To perform Visual Inspection, proceed as follows:

1. Inspect regulator inlet and outlet for foreign objects, dirt corrosion, dents, cracks and other damage.

2. Inspect regulator body for dents, cracks, corrosion, condition of nameplate, security of screws and fittings and for other obvious damage.

9-35. Regulators failing the Visual Inspection or Bench Test (paragraph 9-36) shall be repaired, if specified repair is authorized. SM&R Codes define repairable components and level of maintenance authorized for repair. Further explanation is contained in the Naval Aviation Maintenance Program Manual, OPNAVINST 4790.2 Series.

9-36. BENCH TEST.

WARNING

Because of possible vacuum pump explosion, only water pumped nitrogen, Type I, Class I, Grade B (Fed Spec BB-N-411) shall be used in testing oxygen regulators.

For oxygen test stands and purging equipment, use only nitrogen from any cylinders marked NITROGEN OIL FREE in white letters. Two 3-inch wide black bands mark the tops of these cylinders. Do not use 3500 psig nitrogen cylinders used on NAN servicing cart. These cylinders can not be certified contaminant free.

9-37. The Bench Test shall be performed using an Oxygen Systems Components Test Stand, Model 1172AS100 or 1316AS100. Refer to the appropriate ground support equipment manual for identification of test stand controls and indicators referred to in the Bench Test procedures that follow. Do not attempt to perform any Bench Test before becoming thoroughly familiar with the test stand. Utilize the Performance Test Sheet (figure 9-3) when performing Bench Test.

WARNING

Ensure altitude chamber is configured in accordance with NAVAIR 17-15BC-21, WP003 00, Figure 3, sheets 2 thru 4 as applicable. Ensure High Pressure or Low Pressure Hose Assembly listed in NAVAIR 17-15BC-21, WP031 00, Figure 1 or Figure 2 is attached to N_2 Input Connection (18) or Tee Connection (28) in altitude chamber as applicable for the oxygen regulator being tested. Remove hose assembly not being used and cap connection (18) or (28) when not in use. For regulators requiring inlet pressures greater than 175 psig, the High Pressure Hose Assembly in NAVAIR 17-15BC-21, WP031 00, Figure 1 shall be used.

9-38. OVERALL LEAKAGE TEST. To perform the Overall Leakage Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Compound, Leak Detection, Type 1	MIL-L-25567
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter Assembly	AN816-6D NIIN 00-196-9580
1	Oxygen System Components Test Stand	1172AS100 or 1316AS100

WARNING

Prior to use, inspect leak detection compound. Compound is not clear and free from suspended material sediment is considered contaminated and shall be disposed of. A compound giving off peculiar odors such as acetone or alcohol is considered contaminated and shall be disposed of. Do not use MIL-L-25567 Type II leak detection compound.

CAUTION

At no time shall the regulator be placed in a vise for loosening or adjustment of components. Do not attempt any adjustments to regulator without first removing all traces of sealant and tamper dots. Apply only Krytox or other authorized lubricant to components as directed herein.

NOTE

Tests are arranged to proceed from one test to the next with minimal changes to test set-up or valve positioning.

NOTE

Index numbers refer to figure 9-6 unless otherwise noted.

1. Cap oxygen input connector (18) in altitude chamber.

2. Remove lug from tee connection (28) in altitude chamber and install adapter into tee connection (28). Attach a hose with number 6 caps to adapter.

3. Remove inlet connector assembly (2) and preformed packing (3) from regulator, clean and reinstall in accordance with paragraph 9-47.

4. Remove preformed packing (1) from regulator. Clean in accordance with paragraph 9-49, lubricate preformed packing sparingly with Krytox 240 AC and reinstall in regulator.

5. Cap the regulator body assembly (49) outlet.

6. Connect inlet connector assembly (2) to hose attached to tee connection (28).

7. Ensure all test stand valves and regulators are properly secured and turn on N_2 supply cylinder.

8. Turn INLET PRESS. ON/OFF valve (L) on.

9. Using LOW PRESS REGULATOR (N), slowly apply 70 psig to the regulator inlet.

10. Turn LEAKAGE ON/OFF valve (G) to ON and turn INLET PRESS. ON/OFF valve (L) to OFF.

11. Turn LEAKAGE SELECTOR valve (F) to high position and record leakage on HIGH RANGE LEAKAGE rotameter (8) on Performance Test Sheet. Maximum allowable leakage is 750 ccm.

12. Turn LEAKAGE ON/OFF valve (G) OFF and uncap regulator outlets.

13. Disconnect regulator inlet connector (2) from hose attached to T-connection (28). Proceed to maximum Pressure Relief Valve Test.

14. Refer to table 9-2 for overall leakage test troubleshooting. Use leak detection compound to determine source of excessive leakage.

9-39. MAXIMUM PRESSURE RELIEF VALVE TEST. Perform the maximum Pressure Relief Valve Test as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter Assembly	AN816-6D NIIN 00-196-9580
1	Oxygen System Components Test Stand	1172AS100 or 1316AS100

1. Cap regulator inlet connector (2) and connect regulator body assembly (49) outlet to piezometer (26). Turn on vacuum pump.

2. Connect line from low pressure connection (19) to Ref. Tap and connection (21) in altitude chamber. Turn PRESSURE SELECTOR valve (D) to H_2O position.

3. Slowly open leakage control valve (E) until 750 CCM is indicated on HIGH RANGE LEAKAGE rotometer (8).

4. Using thumb, block the aneroid vent port of the regulator.

5. Observe PRESS/SUCTION manometer (4). Maximum pressure relief valve should relieve between 17 and 20 inH_2O. Record reading on Performance Test Sheet.

6. If reading is within range, proceed to step 7. If reading is not within range, proceed to paragraph 9-45 for adjustment procedures.

7. Close leakage control valve (E). Disconnect line from low pressure connection (19) and Ref. Tap and connection (21) in altitude chamber.

8. Remove cap from regulator inlet connector (2) and connect regulator inlet connection (2) to hose attached to T-connection (28).

9. Proceed to Demand Valve Leakage Test, paragraph 9-40.

Table 9-2. Troubleshooting (Overall and Demand Valve Leakage)

Trouble	Probable Cause	Remedy
Leakage around joints.	Loose screws.	Tighten any loose screws in accordance with Assembly (paragraph 9-54).
	Damaged gasket.	Locate damaged item and replace in packing accordance with Disassembly and Assembly (paragraph 9-48).
	Damaged preformed packing.	
Leaking inlet connector assembly (2).	Damaged inlet connector cone.	Replace in accordance with Disassembly and Assembly (paragraph 9-48).
Leaking seat/diaphragm assembly (30).	Leaking balance valve assembly.	Change the balance valve assembly in accordance with Disassembly and Assembly (paragraph 9-48).
Outlet pressure high at 30 psig, zero demand flow.	Pressure trapped in outlet hose.	Apply a 10 lpm demand flow and reset to zero flow.
	Lever (45) height not correctly set.	Disassemble in accordance with paragaph 9-49 steps 17 and 21. Check, adjust and assemble in accordance with paragraph 9-55 step 7 and steps 9 and 10.
Outlet pressure high at 120 psig, zero demand flow. From 1.5 to 2.0 inH_2O.	Pressure trapped in outlet hose.	Apply 10 lpm demand flow and reset to zero flow.
	Balanced valve bleed flow, not matched with diaphragm assembly.	Change the diaphragm assembly in accordance with Disassembly and Assembly (paragraph 9-48).
Outlet pressure over 1.5 inH_2O after the above remedy or for pressures in excess or +2.0 inH_2O.	Leaking balance valve assembly.	Change the balance valve assembly in accordance with Disassembly and Assembly (paragraph 9-48).
Outlet pressure exceeds +0.001 inH_2O of initial reading after 5 minutes.	Leaking balance valve assembly.	Change the balance valve assembly in accordance with Disassembly and Assembly (paragraph 9-48).

9-40. DEMAND VALVE LEAKAGE TEST. To perform the Demand Valve Leakage Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter Assembly	AN816-6D NIIN 00-196-9580
1	Oxygen System Components Test Stand	1172AS100 or 1316AS100

NOTE

This regulator does not require the use of a piezometer restrictor for Bench Testing. Ensure regulator body assembly (49) outlet and piezometer (26) are one inch apart.

1. Connect regulator body assembly (49) outlet to piezometer (26).

2. Turn INLET PRESS ON/OFF valve (L) to ON.

3. Turn on vacuum pump.

CAUTION

Do not turn PRESS SELECTOR valve (D) to H_2O position if pressure is indicated on DIFF PRESS. GAGE inHg (5). If pressure is indicated open OUTPUT valve (C) to relieve pressure.

4. Turn PRESS SELECTOR valve (D) to H_2O position.

5. Using LOW PRESS REGULATOR (N), adjust inlet pressure to 30 psig as indicated on N_2 INPUT PRESS gage (27).

6. Open then close output valve (C).

7. With output valve (C) closed, read PRESS/SUCTION manometer (4). Record inH_2O reading on Performance Test Sheet. Reading must be between 0.5 and 1.5 inH_2O.

8. With the regulator maintained at step 6 above, record inH_2O reading after a period of 5 minutes. This reading from PRESS/SUCTION manometer (4) on Performance Test Sheet reading must not exceed +0.1 inH_2O of the initial reading.

9. Open and adjust OUTPUT valve (C) to give a 10 lpm flow. Increase inlet pressure with LOW PRESSURE REGULATOR (N) to 120 psig. Close OUTPUT valve (C) Read PRESS/SUCTION manometer (4). Record H_2O reading on Performance Test Sheet. Reading must be between 0.5 and 1.5 inH_2O.

10. With the regulator maintained at 120 psig, record H_2O reading from PRESS/SUCTION manometer (4) on Performance Test Sheet after a period of 5 minutes. This reading must not exceed +0.1 inH_2O of the initial reading.

11. Proceed to Safety Pressure Test.

12. Refer to table 9-2 for Demand Valve Leakage troubleshooting procedures.

9-41. SAFETY PRESSURE TEST. To perform the Safety Pressure Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter Assembly	AN816-6D NIIN 00-196-9580
1	Oxygen System Components Test Stand	1172AS100 or 1316AS100

1. Ensure INLET PRESS. ON/OFF valve (L) is ON and PRESS SELECTOR valve (D) is inH_2O position.

2. Using LOW PRESSURE REGULATOR (N), adjust inlet pressure to 10 psig as indicated on N_2 INPUT PRESS gage (27).

CAUTION

Open FLUTTER DAMPENER valve (J) one quarter of a turn, if regulator causes fluid in PRESS/SUCTION manometer (4) to flutter, open FLUTTER DAMPENER valve (J) slowly under flutter is eliminated.

3. With OUTPUT valve (C) closed, read PRESS/SUCTION manometer (4). Record 0 lpm flow reading on Performance Test Sheet. Reading must be between 0.5 and 1.5 inH_2O.

NOTE

When increasing flows, inlet pressure must be adjusted to maintain correct inlet pressure on N_2 input press. gage (27).

4. Adjust OUTPUT valve (C) to the equivalent of 50 lpm as indicated on output manometer (1). Record reading from PRESS/SUCTION manometer (4) on Performance Test Sheet. Reading must be between 0.5 and 1.5 inH_2O.

5. Adjust OUTPUT valve (C) to the equivalent of 100 1pm as indicated on OUTPUT manometer (1). Record reading from PRESS/SUCTION manometer (4) on Performance Test Sheet. Reading must be between 0.5 and 3.0 inH_2O.

6. Using LOW PRESS REGULATOR (N), adjust inlet pressure to 90 psig as indicated on N_2 INPUT PRESS gage (27).

7. Close OUTPUT valve (C). Record reading from PRESS/SUCTION manometer (4) for 0 lpm flow on Performance Test Sheet. Reading must be between 0.5 and 1.5 inH_2O.

8. Adjust OUTPUT valve (C) to the equivalent of 50 lpm as indicated on OUTPUT manometer (1). Record reading from PRESS/SUCTION manometer (4) on Performance Test Sheet. Reading must be between 0.5 and 1.5 inH_2O.

9. Adjust OUTPUT valve (C) to the equivalent of 100 lpm as indicated on OUTPUT manometer (1). Record reading from PRESS/SUCTION manometer (4) on Performance Test Sheet. Reading must be between 0.5 and 3.0 inH_2O.

CAUTION

When ascending to test altitude maintain a 3.0 inH_2O as indicated on PRESSURE/SUCTION manometer (4) using output valve (C) open flutter dampener valve (J) one quarter turn.

NOTE

If altitude chamber is inadvertently taken above test altitudes, open CHAMBER BLEED valve (K) slowly and descend to desired altitude. Close CHAMBER BLEED valve (K).

10. Using VACUUM CONTROL valve (B), ascend to 10,000 feet as indicated on LOW RANGE ALTM (13).

11. Repeat steps 2 through 9 at an altitude of 10,000 feet.

12. Using VACUUM CONTROL valve (B) ascend to 30,000 feet as indicated on LOW RANGE ALTM (13).

13. Repeat step 2 through 9 at an altitude of 30,000 feet.

14. Continue on to Pressure Breathing Test.

15. If regulator fails Safety Pressure Test, refer to table 9-3, Troubleshooting (Safety Pressure Test).

9-42. PRESSURE BREATHING TEST. To perform the Pressure Breathing Test, proceed as follows.

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter Assembly	AN816-6D NIIN 00-196-9580
1	Oxygen System Components Test Stand	1172AS100 or 1316AS100

Table 9-3. Troubleshooting (Safety Pressure Test)

Trouble	Probable Cause	Remedy
Low outlet pressure at 10 psig, 50 or 100 lpm demand flow.	Partially blocked inlet filter.	Clean inlet filter in accordance with paragraph 9-46.
	Lever (45) height not correctly set.	Disassemble in accordance with paragraph 9-49 steps 17 and 21. Check, adjust and assemble in accordance with paragraph 9-55 step 7 and steps 9 and 10.
High outlet pressure at zero demand flow.	Pressure trapped in outlet hose.	Apply 10 lpm demand flow and reset to zero flow.
High outlet pressure at 30,000 feet.	Pressure breathing aneroid not set correctly.	Adjust in accordance with paragraph 9-44.

NOTE

A 3.0 inH_2O flow must be drawn with OUTPUT valve (C), when ascending to altitude. Open FLUTTER DAMPENER valve (J) one quarter of a turn.

If altitude chamber is inadvertently taken above test altitudes, open CHAMBER BLEED valve (K) slowly and descend to desired altitude. Close CHAMBER BLEED valve (K).

1. Using VACUUM CONTROL valve (B), ascend to 34,000 feet as indicated on LOW RANGE ALTM (13).

2. Using LOW PRESS REGULATOR (N), adjust inlet pressure to 10 psig as indicated on N_2 INPUT PRESS gage (27).

3. With OUTPUT valve (C) closed to 0 lpm flow reading from PRESS/SUCTION manometer (4) on Performance Test Sheet. Reading must be between 0.5 and 2.7 inH_2O.

4. Adjust OUTPUT valve (C) to obtain the equivalent of 100 lpm as indicated on OUTPUT manometer (1). Record reading from PRESS/SUCTION manometer (4) on Performance Test Sheet Reading must be between 0.5 and 3.7 inH_2O.

5. Using low press regulator (N) adjust inlet pressure to 90 psig.

6. With OUTPUT valve (C) closed record 0 lpm flow reading from PRESS/SUCTION manometer (4) on Performance Test Sheet reading must be between 0.5 and 2.7 inH_2O.

7. Adjust OUTPUT valve (C) to obtain the equivalent of 100 lpm as indicated on OUTPUT manometer (1). Record reading from PRESS/SUCTION manometer (4) on Performance Test Sheet. Reading must be between 0.5 and 3.7 inH_2O.

8. Using VACUUM CONTROL valve (B) ascend to 45,000 feet as indicated on HIGH RANGE ALTM (12).

9. Repeat steps 2 thru 7. Reading on PRESS/SUCTION manometer (4) at 45,000 feet must be between 13.0 and 16.0 inH_2O.

10. Using VACUUM CONTROL valve (B), ascend to 50,000 feet as indicated on HIGH RANGE ALTM (12).

11. Repeat steps 2 thru 7. Reading on PRESS/SUCTION manometer (4) at 50,000 feet must be between 16.0 and 20.0 inH_2O.

12. If malfunctions are recorded during Pressure Breathing Test, locate probable cause using table 9-4 Troubleshooting (Pressure Breathing Test).

13. After completion of Pressure Breathing Test, leave OUTPUT valve (C) slightly open. Open CHAMBER BLEED valve (K) and return chamber to sea level. Open chamber door and close OUTPUT valve (C). Turn off vacuum pump.

14. Turn INLET PRESS ON/OFF valve (L) to OFF and remove regulator from test stand.

15. Close N_2 supply cylinder valve and, using LOW PRESS REGULATOR (N) and SYSTEM BLEED VALVE (S), relieve all pressure in the test stand. Secure all test stand valves.

9-43. ADJUSTMENTS.

9-44. PRESSURE BREATHING ANEROID ADJUSTMENT. To adjust the Pressure Breathing Aneroid, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Acetone	O-A-51
As Required	Cloth, Lint-free	—
As Required	Glyptal	1201B (CAGE 24452)

Support Equipment Required

Quantity	Description	Reference Number
1	Wrench, Spanner, Adjustment Peg, Aneroid	3150T000 or locally manufacture

Table 9-4. Troubleshooting (Pressure Breathing Test)

Trouble	Probable Cause	Remedy
Outlet pressure does not increase.	Maximum Pressure Relief Valve not assembled correctly.	Disassemble valve in accordance with paragraph 9-49 steps 9 through 14. Assemble valve in accordance with paragraph 9-55 steps 14 through 18. Adjust valve in accordance with paragraph 9-45.
	Ruptured vent valve diaphragm (seated diaphragm assembly).	Visually check the seat and diaphragm assembly. Replace in accordance with Disassembly (paragraph 9-48) and Assembly (paragraph 9-54).
	Pressure Breathing Aneroid failed.	Change aneroid assembly in accordance with Disassembly (paragraph 9-48), Assembly (paragraph 9-54) and Adjustment (paragraph 9-44).
Outlet pressures will not increase when ascending from 34,000 to 45,000 or from 45,000 to 50,000 feet.	Maximum Pressure Relief Valve not correctly set.	Adjust valve in accordance with paragraph 9-45.
Outlet pressure readings out of limits at 34,000, 45,000 and 50,000 feet.	Pressure Breathing Aneroid not correctly set.	Adjust breathing aneroid in accordance with paragraph 9-44.
Outlet pressure within upper limit range at 34,000 and 45,000 feet but outlet pressure is low at 50,000 feet.	Maximum Pressure Relief Valve set too low.	Adjust valve to higher side of 17 to 20 inH_2O range in accordance with paragraph 9-45.

CAUTION

Do not attempt adjustment of Pressure Breathing Aneroid by turning aneroid post screw located in center of aneroid adjuster. Turning aneroid post screw can cause damage to the aneroid and seat assemblies.

NOTE

Regulators from Serial No. 001 thru 0250 will require the removal of synthetic rubber material from the aneroid assembly (8) adjuster thread, to enable adjustment, using acetone.

1. Apply a small amount of acetone to set screw (6) to soften synthetic rubber material.

2. Loosen set screw (6) using an Allen wrench.

3. Remove all traces of acetone and rubber by wiping the area with a clean lint-free cloth.

4. Using peg spanner wrench, adjust aneroid assembly (8) as necessary. Adjust clockwise to increase outlet pressures or counterclockwise to decrease outlet pressures.

5. Repeat Pressure Breathing Test (paragraph 9-42).

6. When adjustments have been completed, tighten set screw (6) and apply a tamper dot to its end to prevent movement using Glyptal.

9-45. MAXIMUM PRESSURE RELIEF VALVE ADJUSTMENT AND TROUBLESHOOTING PROCEDURES. Adjust and troubleshoot the Maximum Pressure Relief Valve as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Acetone	O-A-51
As Required	Cloth, Lint-free	—

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Glyptal	1201B (CAGE 24452)
As Required	Sealant	Vibratite NIIN 00-163-5792

Support Equipment Required

Quantity	Description	Reference Number
1	Wrench, Spanner, Valve Peg, Pressure Relief, Maximum	3151T000 or locally manufacture

CAUTION

When attempting to adjust the Maximum Pressure Relief Valve, if the slightest resistance is met when turning adjuster (18) do not proceed. Poppet (20) and adjuster (18) are not aligned properly. Disassemble the Maximum Pressure Relief Valve in accordance with paragraph 9-48 and reassemble in accordance with paragraph 9-54.

NOTE

Index numbers refer to figure 9-6 unless otherwise noted.

1. Using acetone, remove sealant from setscrew (16) and loosen setscrew.

2. Remove retaining ring (14) and mesh disc (15).

3. Cap regulator inlet connector (2).

4. Connect regulator body (49) outlet to piezometer (26) in altitude chamber.

5. Using LOW PRESS REGULATOR (N) apply 70 psig to the test stand as indicated on REGULATED LOW PRESS gage (11).

6. Connect line from LOW PRESS CONNECTION (19) to REF TAP and connection (21) in altitude chamber.

7. Turn PRESS SELECTOR valve (D) to H_2O position.

8. Open LEAKAGE CONTROL valve (E) until 750 CCM is indicated on HIGH RANGE LEAKAGE rotometer (8).

9. Using thumb, block aneroid vent port (oval screen port located just below setscrew (6).

10. Observe PRESS/SUCTION manometer (4). Maximum Pressure Relief Valve should relieve between 17 and 20 inH_20. If reading is not within range, perform steps 11, 12, and 13, as applicable. If reading is within range, proceed to step 14.

NOTE

When performing steps 11 and 12, turning adjuster (18) one full turn will change reading approximately 2.0 inH_2O. If turning adjuster (18) does not affect reading on PRESS/SUCTION manometer (4), proceed to step 13.

11. If reading is below 17 inH_2O, turn adjuster (18) clockwise.

12. If reading is above 20 inH_2O, turn adjuster (18) counterclockwise.

13. If turning adjuster (18) does not change reading, block the aneroid vent with your thumb and adjuster (18) with your forefinger and perform step 10. If water fails to rise on PRESS/SUCTION manometer (4), perform following corrective action.

a. Apply acetone to setscrew (6) to remove sealant and loosen setscrew (6).

(1) Using spanner wrench, remove aneroid and adjuster (8).

(2) Clean adjuster threads and apply thin coat of vibratite sealant. Allow sealant to dry for 30 minutes.

(3) Reinstall aneroid and adjuster (8) into regulator body (49) using spanner wrench until adjuster (8) is just below top of regulator body (49).

(4) Retest in accordance with steps 3 through 10.

b. Disassemble Maximum Pressure Relief Valve in accordance with paragraph 9-49. Clean and/or replace dirty or defective parts as applicable and reassemble Maximum Pressure Relief Valve in accordance with paragraph 9-54. Retest in accordance with steps 3 through 10.

c. If dump valve assembly is leaking, replace spring (29), clean or replace diaphragm and seat assembly (30) and retest in accordance with steps 3 through 10.

14. Disconnect line from LOW PRESS CONNECTION (19) and Ref Tap and connection (21), disconnect regulator from piezometer (26) and remove cap from regulator inlet.

15. Tighten setscrew (16) and apply tamper dot using Glyptal to setscrew (16) to prevent movement. Install mesh disc (15) and retaining ring (14). Perform Bench Test in accordance with paragraph 9-36.

9-46. CLEANING.

9-47. INLET CONNECTOR ASSEMBLY FILTER SCREEN. To clean Inlet Connector Assembly (2) Filter Screen, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

1. Remove inlet connector assembly (2) from regulator and preformed packing (3).

2. Clean Inlet Connector Assembly (2) Filter Screen using reverse action flushing with distilled water. Wash preformed packing (3) in distilled water.

3. Blow inlet connector assembly (2) and preformed packing (3) dry with water pumped nitrogen.

4. Install preformed packing (3) on inlet connector assembly (2).

5. Install inlet connector assembly (2) into regulator body assembly (49) and tighten to a torque of 130 to 150 lb-in.

9-48. DISASSEMBLY.

CAUTION

All disassembly procedures must be done on benches having good lighting and in an area provided with air conditioning or air filtering. Walls, floors and ceilings should have a smooth finish and be painted with a nonchalking paint which can be kept clean and dust-free. When disassembling more than one regulator, it is desirable to keep all parts for each individual regulator separated. Plastic partitioned boxes with covers or similar storage facilities should be used to keep the parts segregated and protected from dirt and moisture.

NOTE

Complete disassembly procedures are provided. However, disassemble only to the extent necessary to accomplish repair. Remove protective caps, where necessary, before disassembling components. All screws are assembled using synthetic rubber material or Glyptal 1201B. A small amount of acetone may be used to soften the material prior to removal.

Refer to figure 9-6 for index numbers referred to unless otherwise noted.

9-49. DISASSEMBLY OF REGULATOR. Disassemble the regulator in the following sequence:

Materials Required

Quantity	Description	Reference Number
As Required	Acetone	O-A-51

Support Equipment Required

Quantity	Description	Reference Number
1	Wrench, Spanner, Adjustment Peg, Aneroid	3150T000 or locally manufacture
1	Wrench, Spanner, Valve Peg, Pressure Relief, Maximum	3151T000 or locally manufacture

CAUTION

Do not use magnetized tools at any time when working on oxygen regulators.

1. Remove and discard preformed packing (1) from regulator body assembly (49) outlet connector.

2. Remove inlet connector assembly (2) from regulator body assembly (49) and discard preformed packing (3).

3. Remove pan head screw (4) and non-metallic seal (5) from regulator body assembly (49). Discard non-metallic seal.

4. Remove set screw (6) and pin (7) from regulator body assembly (49).

5. Using peg scanner wrench, unscrew and remove aneroid assembly (8) from regulator body assembly (49).

6. Remove three countersunk head screws (10) and carefully remove plate (9) and preformed packing (11) from regulator body assembly (49). Discard preformed packing. (Acetone may be required to soften synthetic rubber material).

7. Remove two countersunk head screws (13) and remove mounting pin (12).

8. Repeat step 7 to remove the other mounting pin (12).

9. Remove retaining ring (14) and mesh disc (15) from housing (21).

10. Remove set screw (16) and pin (17) from housing (21).

11. Using peg spanner wrench, unscrew and remove adjuster (18) from housing (71).

12. Remove spring (19) and popper (20) from housing (21).

13. Remove three pan head screws (27) and three flat washers (23) and remove housing (21) from regulator body assembly (49).

14. Remove seat (24) and gasket (75) from regulator body assembly (49). Discard gasket.

15. Remove four pan head screws (27) and four flat washers (28) and remove cover assembly (26) from regulator body assembly (49).

16. Remove helical compression spring (29), diaphragm and seat assembly (30), guide (31) and preformed packing (32) from regulator body assembly (49). Discard preformed packing.

17. Remove five countersunk head screws (34) and remove cover (33) and conical spring (35) from regulator body assembly (49).

18. Remove diaphragm assembly (36) from regulator body assembly (49).

19. If necessary, remove identification plate (37) from cover (33). Record engraved details from identification plate in operation for installation of a new plate during assembly. Discard identification plate.

20. Remove two countersunk head screws (43) and remove end cap assembly (42) and preformed packing (44) from regulator body assembly (49). Discard preformed packing.

21. Remove lever (45) from regulator body assembly (49).

CAUTION

Do not damage the balanced valve assembly (46) when removing from the regulator body.

22. Carefully remove balanced valve assembly (46) and spring (41) the regulator assembly (49). Remove and discard two preformed packing (47) from the valve (46).

23. Remove retaining ring (38), remove plug (39) by slightly tapping plug after removal of valve (46), remove and discard preformed packing (40).

24. Remove filter (48) from regulator body assembly (49).

9-50. CLEANING OF DISASSEMBLED PARTS.

9-51. To clean the disassembled parts of the regulator, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Acetone	O-A-51
As Required	Bag, Plastic	MIL-B-117 (CAGE 81349)
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

WARNING

Do not use oil or any material containing oil in conjunction with this equipment. Oil, even in small quantities, coming into contact with oxygen can cause explosion or fire. Dust, lint and fine metal particles are also dangerous.

1. If the identification plate (37) has been removed and the original cover (33) is required for assembly, remove all residual identification plate adhesive from the cover using acetone prior to cleaning.

2. Clean all metallic parts using procedures outlined in NAVAIR 13-1-6.4-1. Blow dry with oil-free nitrogen.

3. Wash all rubber parts in distilled water and blow dry with oil-free nitrogen.

4. After cleaning, inspect all internal surfaces of components to ensure absolute cleanliness. Should further contamination be found, repeat the appropriate cleaning procedure.

5. On satisfactory completion of cleaning, seal all parts in plastic bags for storage or in preparation for inspection and assembly. Bag all complete assemblies that are not immediately returned to service.

9-52. INSPECTION OF DISASSEMBLED PARTS.

CAUTION

All inspection procedures must be done on benches having good lighting and in an area provided with air conditioning or air filtering. Walls, floors and ceilings should have a smooth finish and be printed with a non-chalking paint which can be kept clean and dust-free. Parts submitted for inspection should be returned to their plastic bags immediately after the inspection task to protect from dirt and moisture.

9-53. Inspect the disassembled parts of the regulator as follows:

1. Inspect all metallic parts for cracks, nicks, burns, scratches or other imperfections which could cause leakage or malfunctions of the regulator.

2. Inspect threads of all components for serviceability.

3. Inspect diaphragm and seat assembly (30) and diaphragm assembly (36) for punctures, tears and signs of deteriorating.

4. Inspect identification plate (37) for condition and legibility. The plate may still be attached to cover (33).

5. Inspect all springs, replace any spring which shows signs of obvious damage or distortion.

6. Ensure the cleanliness of all components has been maintained. Clean any soiled parts in accordance with Cleaning (paragraph 9-50).

9-54. ASSEMBLY.

CAUTION

All assembly procedures must be done on benches having good lighting and in area provided with air conditioning or air filtering. Walls, floors and ceilings should have a smooth finish and be painted with a non-chalking paint which can be kept clean and dust-free.

NOTE

Remove protective caps, where necessary, before assembling components.

All screws are to be locked with Glyptal.

Preformed packing may be very sparingly coated with Krytox 240 AC Type II to ease assembly.

9-55. Assemble the regulator in the following sequence:

Materials Required

Quantity	Description	Reference Number
As Required	Adhesive/Sealant, 3145 RTV, Dow Corning	MIL-A-46146
As Required	Krytox 240 AC Lubricant	NIIN 00-961-8995
As Required	Loctite Multibond	Depend 350
As Required	Glyptal	1201B (CAGE 24452)
As Required	Sealant	Vibratite NIIN 00-163-5792
1	Wrench, Spanner, Adjustment Peg, Aneroid	3150T000 or locally manufacture
1	Wrench, Spanner, Valve Peg, Pressure Relief, Maximum	3151T000 or locally manufacture
1	Wrench, Torque, 300 lb-in	TE25A (CAGE 55719) NIIN 00-776-1841 or equivalent

Support Equipment Required

Quantity	Description	Reference Number
1	Tool, Adjustment, Lever Height, Demand Valve	2792T000 or locally manufacture (figure 9-4)

CAUTION

Do not use magnetized tools at any time when working on oxygen regulators.

NOTE

Lubricate all preformed packing with Krytox 240 AC prior to installing in regulator.

1. Install filter (48) into regulator body assembly (49) with split in filter diametrically opposite outlet hole.

2. Install two new preformed packing (47) on balanced valve assembly (46) and install balanced valve assembly into regulator body assembly (49).

3. Install new preformed packing (44) on end cap assembly (42).

CAUTION

When installed, toe flange of end cap assembly (42) does not seat flush against regulator body assembly (49). Countersunk head screws (43) must be tightened evenly to avoid stressing the flange. Do not overtighten.

4. Position lever (45) over balanced valve assembly (46). Install end cap assembly (42) in regulator body assembly (49) ensuring pin of end cap engages lever. Secure end cap to body with two countersunk head screws (43). Tighten screws evenly to a torque of 2.0 to 2.5 lbs-in.

5. Install new preformed packing (40) on plug (39).

6. Install spring (41) and plug (39) into regulator body assembly (49) ensuring spring is located between plug and balanced valve assembly (46). Secure plug in position with retaining ring (38).

7. With the regulator held in the horizontal position, so that the mounting pins (12) are lowermost, check that the tip of the lever (45) is between 0.000 in. and 0.020 in. below the body surface using demand valve lever height adjustment tool. It is permissible to remove and carefully bend the lever (45) at its elbow to achieve the required height (figure 9-5).

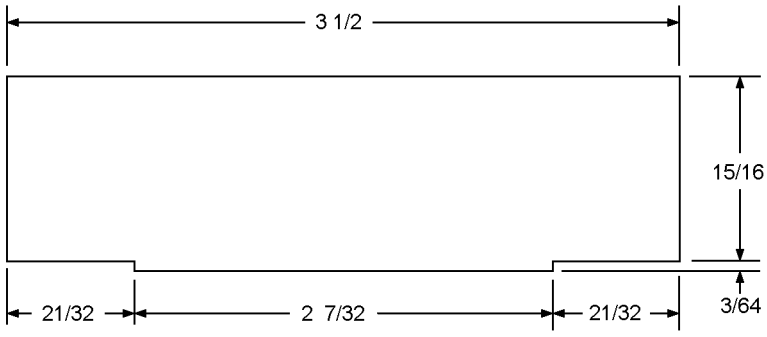

Figure 9-4. Demand Valve Lever Height Adjustment Tool

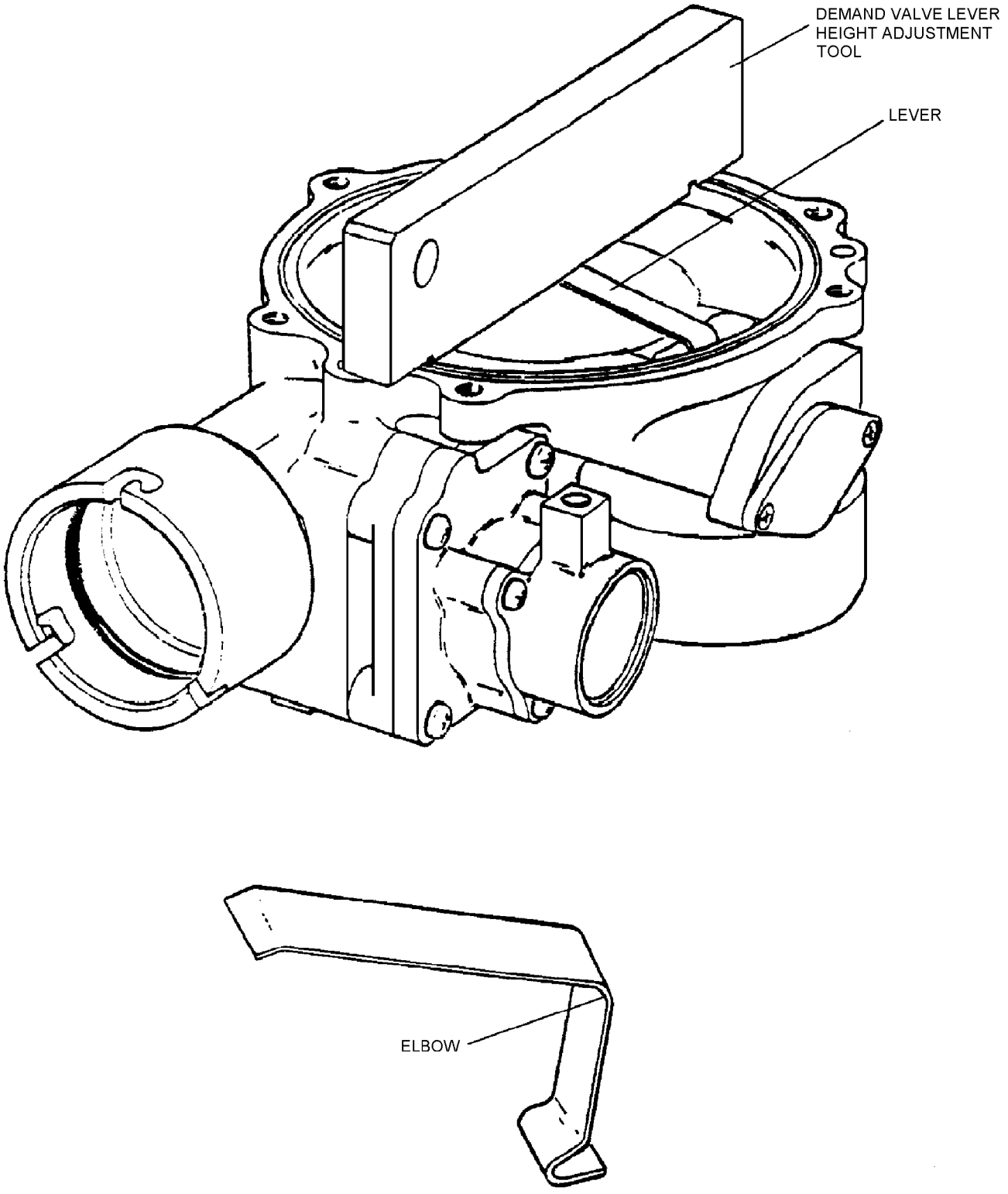

Figure 9-5. Lever Height Adjustment

8. If it was found necessary to remove identification plate (37), install a new plate as follows:

a. Permanently mark a new identification plate (37) with the details recorded during disassembly.

b. Ensure that the identification plate (37) and cover (33) have been cleaned in accordance with paragraph 9-50.

NOTE

Loctite Multibond is supplied in two parts, an adhesive and activator.

c. Apply an even coating of Loctite Multibond adhesive to the rear of the identification plate (37). Apply an even coating of Loctite Multibond activator to the area of the cover (33) where the plate is to be installed. Position the identification plate (37) on the cover (33) and press down firmly.

NOTE

After the adhesive and activator has been brought into contact, handling strength will be reached within 4 minutes.

d. Remove surplus Loctite and clean the assembly in accordance with paragraph 9-50.

9. Locate diaphragm assembly (36) in its groove in regulator body assembly (49).

10. Install conical spring (35) and cover (33) on diaphragm assembly (36) and attach cover to regulator body assembly with five countersunk head screws (34). Tighten screws to a torque of 4.0 to 5.0 lbs-in.

11. Install new preformed packing (32) into groove in regulator body assembly (49).

12. Install diaphragm and seat assembly (30) into guide (31) locating diaphragm in groove in guide.

13. Position helical compression spring (29) on diaphragm and seat assembly (30) and install cover assembly (26) over spring and diaphragm. Ensuring diaphragm locates correctly in grooves in cover and guide, attach this assembly to regular body assembly (49) with four pan head screws (27) and four flat washers (28). Tighten screws to a torque of 4.0 to 5.0 lbs-in.

14. Install a new gasket (25) and seat (24) into cover assembly (26).

15. Install housing (21) into cover assembly (26), with set screw facing towards the cover (33) of the regulator and attach with three pan head screws (22) and three flat washers (23). Tighten screws to a torque of 1.5 to 2.0 lbs-in.

CAUTION

Ensure the poppet stem is engaged into the adjuster properly, if not poppet will not operate and may become damaged.

16. Install poppet (20), spring (19) and adjuster (18) into housing (21). Use peg spanner wrench to screw in adjuster.

17. Install pin (17) and set screw (16) into housing (21).

18. Install mesh disc (15) into housing (21) and retain with retaining ring (14).

19. Install mounting pin (12) on regulator body assembly (49) and attach with two countersunk head screws (13). Tighten screws to a torque of 1.5 to 2.0 lbs-in.

20. Repeat step 19 to install the other mounting pin (12).

21. Install new preformed packing (11) in groove in plate (9).

22. Install plate (9) into regulator body assembly (49) and attach with three countersunk head screws (10). Tighten screws to a torque of 2.0 to 2.5 lbs-in.

NOTE

Prior to performing step 23, apply Vibra-tite sealant to threads of aneroid adjuster (8) and allow to cure for 30 minutes.

23. Using peg spanner wrench, install aneroid assembly (8) into regulator body assembly (49).

24. Install pin (7) and set screw (6) into regulator body assembly (49).

25. Install pan head screw (4) and a new non-metallic seal (5) into regulator body assembly (49). Tighten screw to a torque of 4.0 to 5.0 lbs-in.

26. Install new preformed packing (3) on inlet connector assembly (2).

27. Install inlet connector assembly (2) into regulator body assembly (49). Tighten connector to a torque of 130 to 150 lbs-in.

28. Install new preformed packing (1) in regulator body assembly (49) outlet.

29. Install protective cap (50) on inlet connector assembly (2).

30. Install protective cap (51) on regulator body assembly (49) outlet.

31. Using small amount of Dow Corning 3145 RTV, apply sealant over aneroid post screw located in center of aneroid adjuster.

NOTE

Regulator must be tested to the requirements of paragraphs 9-36, 9-38, 9-40, 9-41 and 9-42 following any disassembly/rebuild activity.

Section 9-5. Illustrated Parts Breakdown

9-56. GENERAL.

9-57. This section lists and illustrates the procurable parts of the Chest Mounted Positive Pressure Regulator, CRU88/P, P/N 2900W000.

9-58. The Illustrated Parts Breakdown should be used during maintenance when requisitioning and identifying parts.

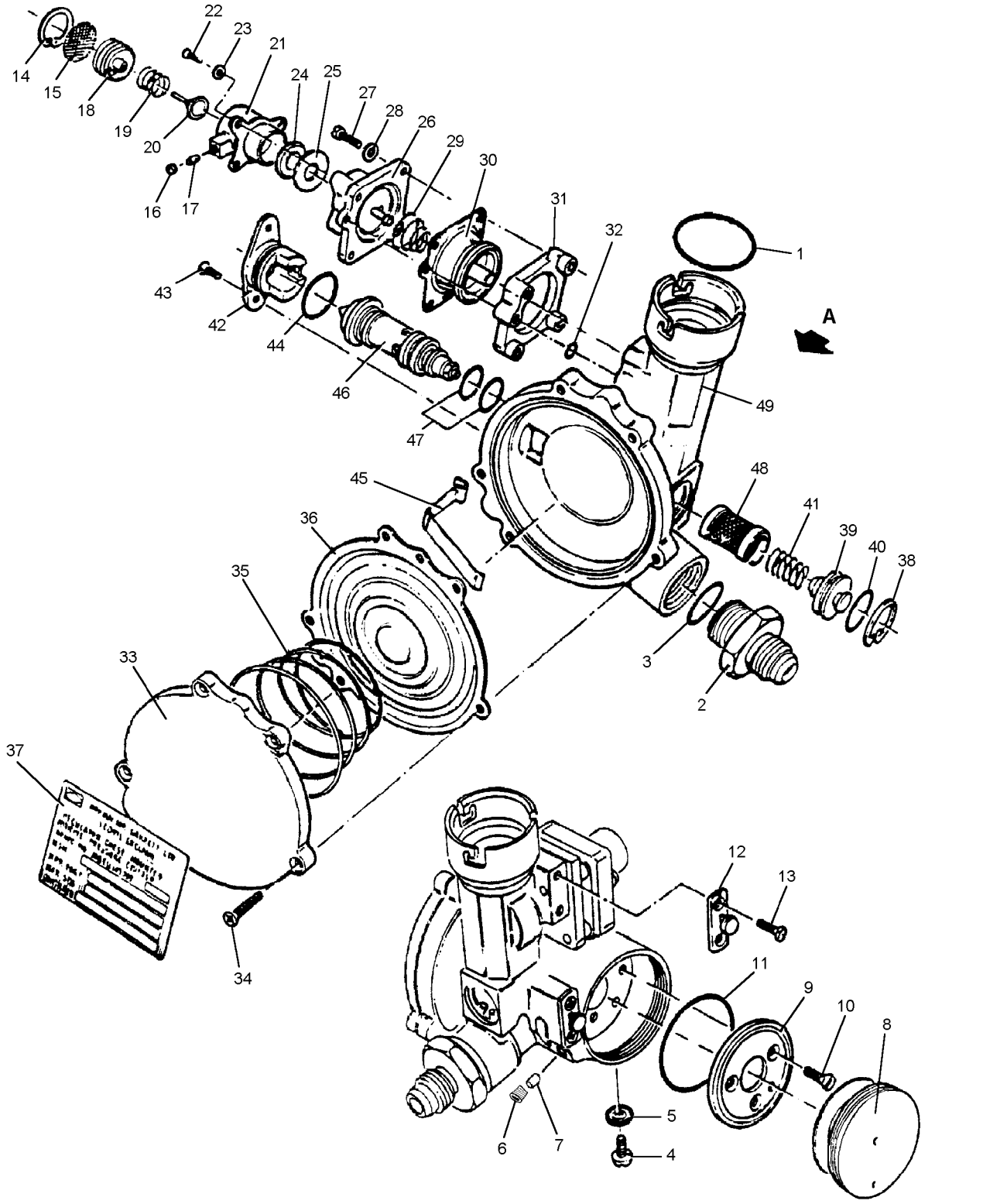

Figure 9-6. Chest Mounted Positive Pressure Regulator

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
9-6	2900W000-001	REGULATOR, POSITIVE PRESSURE . . . . . CHEST MOUNTED (CRU-88/P)	REF	
-1	MS9068-021	. PACKING, Preformed	1	
-2	2900W080	. CONNECTOR, ASSEMBLY, Inlet	1	
-3	MS9385-06	. PACKING, Preformed	1	
-4	MS35206-225	. SCREW, Pan Head	1	
-5	2478W118	. SEAL, Non-Metallic	1	
-6	AN565A8H2	. SCREW, Set	1	
-7	2845W069	. PIN	1	
-8	2900W710	. ANEROID ASSEMBLY, Complete with . . . . . Adjuster	1	
-9	2900W175	. PLATE . . . . . (ATTACHING PARTS)	1	
-10	MS24693-S2	. SCREW, Countersunk Head . . . . . ---*---	3	
-11	MS9068-024	. PACKING, Performed	1	
-12	2900W094	. PIN, Mounting . . . . . (ATTACHING PARTS)	2	
-13	MS51959-4	. SCREW, Countersunk Head . . . . . ---*---	4	
-14	MS16625-1050	. RING, Retaining	1	
-15	2845W065	. DISC, Mesh	1	
-16	AN565A8H2	. SCREW, Set	1	
-17	2845W069	. PIN	1	
-18	2845W068	. ADJUSTER	1	
-19	2900W177	. SPRING	1	
-20	2845W063	. POPPET	1	
-21	2900W119	. HOUSING . . . . . (ATTACHING PARTS)	1	
-22	MS35206-203	. SCREW, Pan Head	3	
-23	NAS620-2	. WASHER, Flat . . . . . ---*---	3	
-24	2845W064	. SEAT	1	
-25	2845W066	. GASKET	1	
-26	2900W100	. COVER ASSEMBLY . . . . . (ATTACHING PARTS)	1	
-27	MS35206-218	. SCREW, Pan Head	4	
-28	NAS620-4L	. WASHER, Flat . . . . . ---*---	4	
-29	2284W177	. SPRING, Helical Compression	1	
-30	2900W700	. DIAPHRAGM AND SEAT ASSEMBLY	1	
-31	2845W177	. GUIDE	1	
-32	1532S014	. PACKING, Preformed	1	
-33	2900W093	. COVER . . . . . (ATTACHING PARTS)	1	
-34	MS24693-S4	. SCREW, Countersunk Head . . . . . ---*---	5	

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
9-6-35	2900W174	. SPRING, Conical	1	
-36	2900W220	. DIAPHRAGM ASSEMBLY	1	
-37	2900W176	. PLATE, Identification	1	
-38	MS16625-1056	. RING, Retaining	1	
-39	2900W095	. PLUG	1	
-40	MS9068-013	. PACKING, Preformed	1	
-41	2900W097	. SPRING	1	
-42	2900W040	. CAP ASSEMBLY, End	1	
		(ATTACHING PARTS)		
-43	MS24693-S2	. SCREW, Countersunk Head	2	
		---*---		
-44	MS9068-014	. PACKING, Preformed	1	
-45	2284W103	. LEVER	1	
-46	2900W020	. VALVE ASSEMBLY, Balanced	1	
-47	MS9068-012	. PACKING, Preformed	2	
-48	2900W118	. FILTER	1	
-49	2900W010	. BODY ASSEMBLY, Regulator	1	
-50	NAS817-6	. CAP, Protective	1	
-51	M5501-7-F23	. CAP, Protective	1	

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MS16625-1056	9-6-38	PAGZZ
MS24693-S2	9-6-10	PAGZZ
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2845W064	9-6-24	PAGZZ
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2845W069	9-6-7	PAGZZ
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2900W010	9-6-49	XAGZZ
2900W020	9-6-46	PAGZZ
2900W040	9-6-42	PAGZZ
2900W080	9-6-2	PAGZZ
2900W093	9-6-33	PCGZZ
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2900W095	9-6-39	PAGZZ
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